TITLE: Uniqueness and generic singularities of solutions to some nonlinear wave equations.

ABSTRACT: Even for smooth initial data, it is well know that solutions to nonlinear hyperbolic PDEs can develop singularities in finite time. As a consequence, uniqueness and continuous dependence on initial data require a more careful analysis.

This talk will focus on some classes of one-dimensional wave equations, including the Camassa-Holm and the variational wave equation $u_{tt} - c(u)(c(u)u_x)_x = 0$.

For conservative solutions, uniqueness can be established by a suitable refinement of method of characteristics, accounting for energy conservation.

Using Thom's transversality theorem, one can show that, for "almost all" initial data (in a topological sense), the solutions of these wave equations are smooth outside a locally finite number of curves in the t-x plane. A detailed asymptotic description of the various types of singularities will also be given.